tactile organ, while the remaining legs are used in locomotion (Levi and Lewi 1968). Wind-scorpions are nocturnal, exclusively carnivorous, generally preying on insects, but they also kill and eat larger animals, such as scorpions and small lizards. Principally they are desert forms, but in India they are also found in forests (Anon. 1991). A review of the literature reveals that wind-scorpions are little known in the Indian Fauna. Pocock (1900) recorded 17 species of Solifugae in 3 genera under 2 families, including three species from Central India, namely *Galeodes fatalis* Lichtenstein & Herbst, *Galeodes orientalis* Stoliczka and *Galeodes indicus* Pocock. According to Pocock (1900), *Galeodes fatalis* is known from Gwalior in Madhya Pradesh, North India, Bengal and Kathiawar; *Galeodes orientalis* from Gwalior, Kathiawar, Birbhum, Delhi, Bihar and Uttaranchal, while *Galeodes indicus* is known from Gwalior in Madhya Pradesh, Bilaspur in Chhattisgarh, Gaya in Bihar and Thane in Maharashtra. Unfortunately, since Pocock (1900), there has been no major work on the Indian Solifugae (Anon. 1991).

While identifying some arachnid fauna collected by a survey team of Zoological Survey of India, Jabalpur, from Seoni district, we came across an interesting juvenile specimen of the genus *Galeodes*, an account of which is given as follows:

Family: Galeodidae

Genus: *Galeodes* Olivier

***Galeodes* sp.**

Material examined: 1 ex. (immature); loc. Chewarighat, Seoni district, Madhya Pradesh; coll. K. Chandra, 6.vi.2001 (Regn. No. A/949).

Measurements (in mm): Total length 8; width of head 2; length of palpus 10; length of I leg 5, II leg 4.5, III leg 8.5, IV leg 13.

Colour: Cephalothorax brownish, legs light brown, abdomen blackish-brown.

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REFERENCES

Anon. (1991): Solpugida. Animal Resources of India. Zoological Survey of India, Kolkata. 475 pp.

Levi, H.W. & L.R. Lewi (1968): Spiders and their kin. Golden Press, New York. 118 pp.

Pocock, R.I. (1900): The Fauna of British India including Ceylon and Burma. Arachnida. Taylor and Francis, London, pp. 132-152.

24. OCCURRENCE OF THE MUD CRAB *SCYLLA TRANQUEBARICA* (FABRICIUS) (BRACHYURA: PORTUNIDAE) FROM THE WEST COAST OF INDIA

A study of commercially important crab species of north Konkan zone, especially from ponds in Uran area of Raigad district of coastal Maharashtra revealed that, besides *Scylla serrata*, *S. tranquebarica* was also reared in the ponds. The study thus revealed that *S. tranquebarica*, which was so far reported only from India's east coast, also occurs on the west coast.

The mud crab *Scylla serrata* (Forskal), also known as mangrove swimming crab, is one of the commonest, large and widely distributed crabs in the Indo-Pacific region. Due to its large size, abundant availability close to the shore (being an estuarine species) and fetching a high price, a good deal of attention has been paid to its taxonomy and fishery (Sakai 1976; Kathirval and Srinivasagam 1992; Fuseya and Watanabe 1995; Watanabe and Fuseya 1997).

There has been confusion as to whether *S. serrata* is a complex of several species/ subspecies, or if these are morphological variations of a single species. Earlier authors preferred to use a single name for the species, namely *S. serrata*. However, from around 1949 onwards taxonomists (Estampador 1949; Serene 1952; Joel and Sanjeeva Raj 1983; Oshiro 1988; Fuseya and Watanabe 1996; Overton *et al.* 1997; Keenan *et al.* 1998; Fuseya 1998) have recognized two to four different species or subspecies. In contrast, Stephenson and Campbell (1960) attributed their morphological variations to environmental differences. Fushimi and Watanabe (2001) have reviewed the problems in species identification of crabs of the genus *Scylla*.

The use of popular names for *S. serrata* is also confusing. The common usage of "mud crabs" is rather unfortunate, as there are so many crabs – both walking and swimming – that live in mudflats. Even the term "mangrove

crab" is confusing, as this term is used for crabs of the genus *Sesarma*. Chhapgar (pers. comm.) prefers the usage of "mangrove swimming crab" as it distinguishes the swimming *Scylla* from the walking *Sesarma*.

During our survey of the fattening ponds for *Scylla* at Uran in coastal Raigad district of Maharashtra, *S. serrata* was seen to be the predominant form, occurring throughout the year. However, only during the monsoon season, we came across *S. tranquebarica* in fair numbers. Comparison of the teeth on the antero-lateral borders of the carapace and teeth on the carpus of the chelipeds and the sharpness of the teeth on the front (i.e., between the eyes) was adequate to separate the two species of *Scylla*. *S. tranquebarica* is locally called "*shen kurla*", while *S. serrata* is called "*Lal chimbori*" in the North Konkan region.

Morphometric Characters

Two male specimens of *S. tranquebarica* were collected from Uran area and preserved at the Taraporevala Marine Biological Research Station, Mumbai; measurements for both the specimens are given in Table 1.

Chhapgar (1957, 1962) has included *S. serrata* in his taxonomic work on the marine crabs of the erstwhile Bombay state (now Gujarat and Maharashtra states and Uttar Kannad district of Karnataka state). His illustration, however, shows two distinct spines on the outer face of the carpus of the chelipeds, four sharply acuminate teeth of the front (between the eyes) and nine sharply acuminate teeth on the antero-lateral borders. He states (pers. comm.) that he had referred to the papers by Estampador (1949) and Serene (1952), and was even inclined to treat the two forms (*serrata* and *tranquebarica*) as separate species. However, he ultimately preferred the then prevalent view of clubbing the two forms into *S. serrata*.

Table 1: Morphometric measurements of the specimens collected from Uran

	Measurements	Specimen 1 (Weight 850 gm)	Specimen 2 (Weight 130 gm)
i	Length of carapace	120 mm	66 mm
ii	Breadth of carapace	170 mm	93 mm
iii	Length of left cheliped	205 mm	104 mm
iv	Length of right cheliped	225 mm	114 mm
v	Length of rostrum	5 mm	3 mm
vi	Ratio of length: breadth of carapace	0.705	0.709
vii	Ratio of length of left cheliped: length of right cheliped	911	0.912

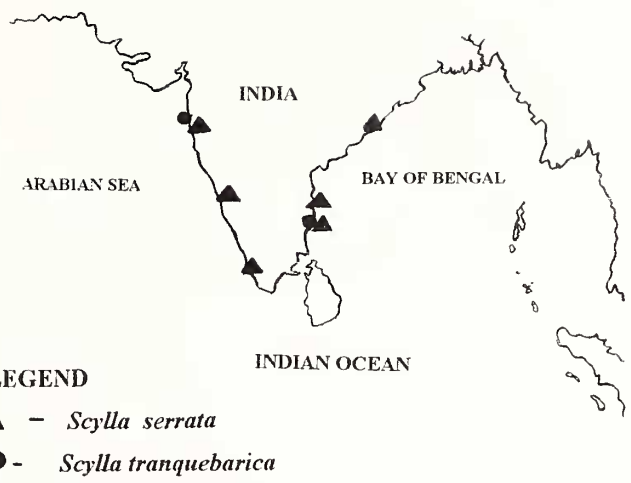

Fig. 1: Distribution of *Scylla tranquebarica* (Fabricius) on the east and west coast of India

Distribution

As per the information on geographical distribution of *S. tranquebarica* in India, the species is only reported from Parangipattai (Porto Nova) on the east coast (Anon. 1998) (Fig. 1). The occurrence of *S. tranquebarica* from north Konkan region of Maharashtra and the west coast is, therefore, confirmed by us.

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REFERENCES

ANON. (1998): Biogeography of *Scylla tranquebarica*. Bioinformatics Centre, National Institute of Oceanography, Goa.

CHHAPGAR, B.F. (1957): On the marine crabs (Decapoda: Brachyura) of Bombay State. *J. Bombay Nat. Hist. Soc. 54(2 & 3)*: 399-439.

CHHAPGAR, B.F. (1962): Crab fishing at Bombay. *J. Bombay Nat. Hist. Soc. 59(1)*: 306-309.

ESTAMPADOR, E.P. (1949): Studies on *Scylla* (Crustacea: Portunidae). Revision of the genus. *Philip. J. Sci. 78(1)*: 95-108.

FUSEYA, R. (1998): Studies on the species identification of the genus *Scylla*. Ph.D. Thesis of the Tokyo University of Fisheries, 170 pp. [In Japanese].

FUSEYA, R. & S. WATANABE (1995): Notes on the taxonomy of the genus *Scylla*. *Cancer (4)*: 5-8. [In Japanese].

FUSEYA, R. & S. WATANABE (1996): Genetic variability in the mud crab genus *Scylla*. (Brachyura: Portunidae). *Fish. Sci. 62(5)*: 705-709.

FUSHIMI, H. & S. WATANABE (2001): "Problems in species identification of the mud crab genus *Scylla* (Brachyura: Portunidae)". Research article on Web. 5 pp.

JOEL, D.R. & P.J. SANJEEVA RAJ (1983): Taxonomic remarks on two species of the genus *Scylla* De Haan (Portunidae: Brachyura) from Pulicat Lake. *Indian J. Fish. 30*: 13-26.

KATHIRVAL, M. & S. SRINIVASAGAM (1992): Taxonomy of the mud crab, *Scylla serrata* (Forskal), from India. The mud crab. Pp. 132-172. *In*: A report on the seminar convened in Surat Thani, Thailand. (Ed: Angell, C.A.). November 5-8, 1991. Bay of Bengal Programme, Madras, India.

KEENAN, C.P., P.J.F. DAVIE & D.L. MANN (1998): A revision of the genus *Scylla* de Haan, 1833 (Crustacea: Decapoda: Brachyura: Portunidae), *The Raffles Bulletin of Zoology 46(1)*: 217-245.

OSHIRO, N. (1988). Mangrove crabs (*Scylla* spp.), Aquaculture in tropical areas (S. Syokita, ed.), Midorishobo, Tokyo: 198-209. [In Japanese]

OVERTON, J.L., D.J. MACINTOSH, & R.S. THORPE (1997): Multivariate analysis of mud crab *Scylla serrata* (Brachyura: Portunidae) from four locations in South-east Asia. *Mar. Biol. 128*: 55-62.

SAKAI, T. (1976): Crabs of Japan and the adjacent seas. *Kodansha*, Tokyo. Pp. 335-336.

SERENE, R. (1952): Les especes du genere *Scylla* a Nhatrang (Vietnam). *Proc. Indo-Pacific Fish. Council 3(2)*: 133-137.

STEPHENSON, W. & B. CAMPBELL (1960): The Australian Portunids (Crustacea: Portunidae). IV. Remaining genera. *Austr. J. Mar. & Freshwater Res. 11*: 73-122.

WATANABE, S. & R. FUSEYA (1997): Notes on the identification of the species in genus *Scylla*. *Cancer* 6: 33-36.

25. NEW SITES OF *NEPENTHES KHASIANA* FROM MEGHALAYA WITH NEW EASTERN AND WESTERN RANGE EXTENSIONS

The pitcher plant *Nepenthes khasiana* Hk. f. is the only *Nepenthes* species of carnivorous herbs, found in the Indian subcontinent. It is endemic to Meghalaya. *Nepenthes khasiana* was known only from the southern faces of Meghalaya plateau. Its reported western limit is Baghmara (90° 40' E) in South Garo Hills district, while the eastern limit was at Jowai in Jaintia Hills district (92° 12' E) (Rodgers and Gupta 1989). The eastern range extended recently when a site was discovered near Umtra, also in Jaintia Hills (Choudhury 2000).

I report some more sites, which were hitherto unrecorded or overlooked including new eastern and western

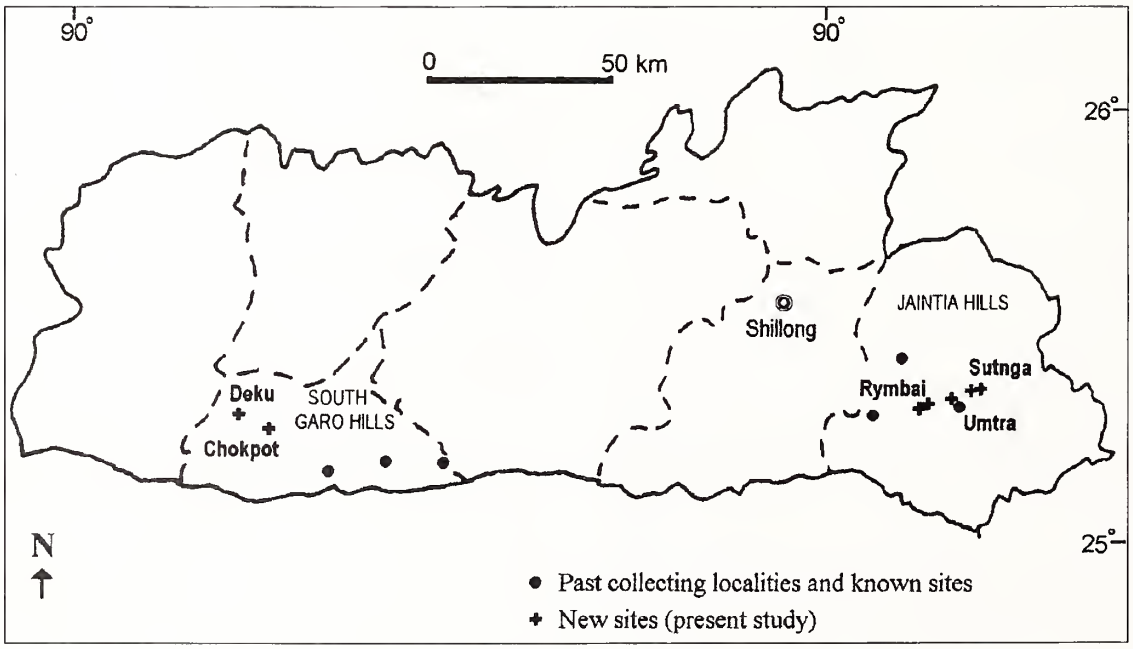

Fig. 1: Map of Meghalaya showing the localities of *N. khasiana*